



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/593,772

09/22/2006

Go Ono

0171-1311PUS1

9154

2292 7590 07/10/2009
BIRCH STEWART KOLASCH & BIRCH
PO BOX 747
FALLS CHURCH, VA 22040-0747

EXAMINER

CLARK, GREGORY D

ART UNIT

PAPER NUMBER

1794

NOTIFICATION DATE

DELIVERY MODE

07/10/2009

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary	Application No. 10/593,772	Applicant(s) ONO ET AL.	
	Examiner GREGORY CLARK	Art Unit 1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>09/22/2006</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

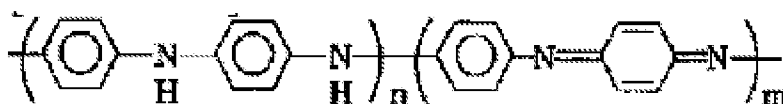
A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

2. **Claim 1-3 is rejected under 35 U.S.C. 102(b) as being anticipated by Oka (JP-07-090179).**

3. **Regarding Claim 1**, Oka discloses a charge transporting substance made of a charge transporting polyaniline and a polyimide (abstract). The polyimide (polyamide acid) is soluble in a solvent (paragraph 8). The polyaniline has an average molecular weight of 2000 to 500,000. Oka also discloses that the molecular weight of the polyaniline-polyimide complex (copolymer) is kept in a range have suitable solubility in a solvent (paragraphs 6 and 7). The applicant claims an average molecular weight of 250 to 5000.

4. **Regarding Claims 2 and 3**, Oka discloses that the charge transporting substance is represented the polyaniline Formula 1:

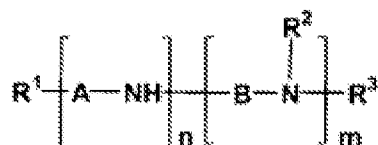


Formula 1

Art Unit: 1794

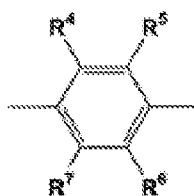
Formula 1 represents the polymerization of divalent groups.

The applicant claims charge transporting varnish represented by Formula 2:

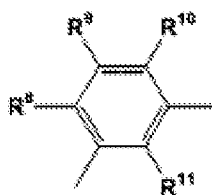


Formula 2

5. where R1-R3 are H , monovalent hydrocarbon group or organoxy group, A and B is a divalent group represented by Formula 3 or 4:



Formula 3

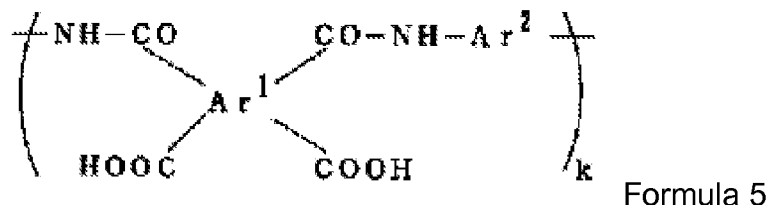


Formula 4

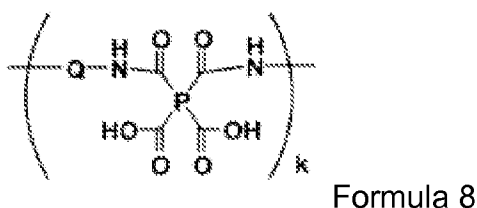
Formula 1 of Oka reads on the applicants' Formula 2.

6. **Regarding Claims 5**, Oka discloses a weight ratio of polyaniline to polyamide is 1:0.1 - 1:10 which equates to a polyaniline weight range of 90% (1/1.1) to 9% (1/11) (paragraph 12).

Regarding Claims 6-7, Oka discloses that the polyimide precursor is represented by Formula 5 (shown below) with an average molecular weight of 1000-500,000. Ar1 is a tetravalent aromatic ring and Ar2 is a divalent aromatic ring (paragraph 4).



The applicant claims a polyimide precursor represented by Formula 8:



where Q can be a divalent phenyl group and P can be a tetravalent phenyl group.

7. **Claims 1, 10 and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Kin (JP-11-185962).**

8. **Regarding Claims 1, 10 and 11**, Kin discloses a doped polyaniline (charge transporting substance) (paragraphs 28-30) and the dopant can be benzenesulfonic acid (charge transporting dopant) (paragraph 30). The polyimides are soluble in organic solvent (paragraph 39).

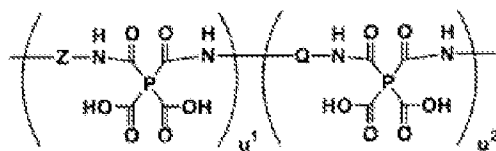
Kin also discloses a polyimide thin film layer (charge transporting varnish) (paragraph 32) as a component of an electroluminescent device (abstract).

9. **Claims 4 and 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oka (JP-07-090179).**

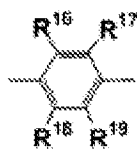
10. **Regarding Claim 4**, Oka discloses that the repeat unit values for n and m are as follows: $m + n = 10-5000$. The applicant claims $m+n$ is less than or equal to 6.

The examiner takes the position that Oka explains that molecular weight effects the ultimate solubility of the polymer. Polymers with molecular weights that are too high would be expected to have lower solubility in a solvent. With a reasonable expectation of success, a person of ordinary skill in the art would test a series of polymers with varying (different value of $m + n$) molecular weight ranges to determine which range give suitable solubility properties which would have included the range claimed by the applicant, absent unexpected results.

11. **Regarding Claims 8 and 9**, Oka discloses a polyimide precursor represented by Formula 5 (shown above). Formula 5 is a polymeric species with repeat units connected through $-NH-Ar_2-NH-$ (an aryl-diamine) which reads on the applicants' Q group (see Q group below) in Formula 7 (shown below):



Formula 7



(13) Q group



(18)

(19)

Z groups

Oka also discloses that the polyimide precursor can be made by the reaction of a tetracarboxylic dianhydride or tetracarboxylic ester or tetracarboxylic acid halide with a diamine (paragraphs 9 and 10).

Oka further discloses that other diamines based on phenylenediamine and diaminobiphenyl (Z groups, the class of compounds listed in applicants' structures 22-27 in claim 9) can be used to make polyimides precursors that are analogous to Formula 5. The phenylenediamine or diaminobiphenyl compounds can have the following groups attached: methylenebis (aniline), bis (aminophenoxy) benzene, bis (aminophenoxy) biphenyl and bis [(aminophenoxy) phenyl] propane.

Oka also indicates the above groups can be further substituted (defined as W in the applicants' structures 22-27 in claim 9) with halogens, alkoxy (methoxy, ethoxy, propoxy) groups, or alkyl groups (methyl, ethyl, propyl) (paragraph 9 and 10).

The examiner takes the position that Oka discloses a polyimide precursor that can contain both Z and Q groups.

Art Unit: 1794

It would have obvious to a person of ordinary skill in the art at the time of the invention to use a combination of diamine species defined as Z and Q groups in Formula 7 to make suitable polyimide precursors through a reaction with a tetracarboxylic derivative.

Oka fails to disclose a propagation level of $u_1/(u_1 + u_2)$ as greater than or equal to 0.2.

The examiner takes the position that Oka discloses that the molecular weight is kept in a range to have suitable solubility in a solvent (paragraphs 6 and 7). The average molecular weight is ultimately controlled by the propagation level. With a reasonable expectation of success, a person of ordinary skill in the art at the time of the invention would test a series of polymers with varying propagation levels to determine which range gave suitable solubility properties which would have included the propagation level claimed by the applicant.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GREGORY CLARK whose telephone number is (571)270-7087. The examiner can normally be reached on M-Th 7:00 AM to 5 PM Alternating Fri 7:30 AM to 4 PM and Off.

Art Unit: 1794

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Larry Tarazano can be reached on (571) 272-1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. Lawrence Tarazano/
Supervisory Patent Examiner, Art Unit 1794

GREGORY CLARK/GDC/
Examiner
Art Unit 1794